

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
4 March 2004 (04.03.2004)

PCT

(10) International Publication Number
WO 2004/018153 A3

(51) International Patent Classification⁷: **B25B 23/14**,
G01L 3/10, H02K 35/02

(21) International Application Number:
PCT/EP2003/009349

(22) International Filing Date: 22 August 2003 (22.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0219745.7 23 August 2002 (23.08.2002) GB

(71) Applicant (for all designated States except US): **FAST TECHNOLOGY AG** [DE/DE]; Otto-Hahn-Strasse 24, Gewerbegebiet Riemerling, 85521 Ottobrunn (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KELLY, David**

[US/DE]; c/o Fast Technology AG, Otto-Hahn-Strasse 24, Gewerbegebiet Riemerling, 85521 Ottobrunn (DE). **MAY, Lutz, Axel** [DE/DE]; Wolfratshauser Strasse 23a, 82538 Gelting (DE).

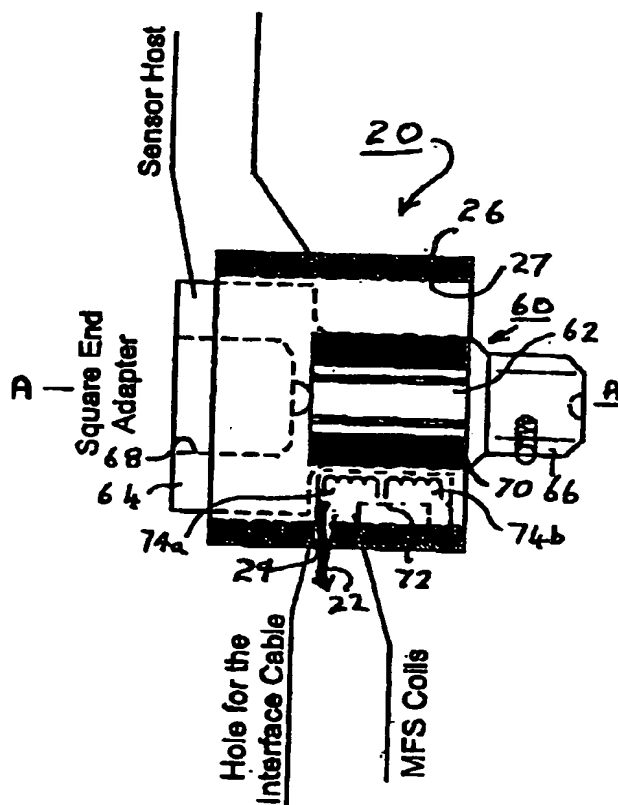
(74) Agent: **STRAUS, Alexander**; Becker.Kurig.Straus, Bavariastrasse 7, 80336 München (DE).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: TORQUE SENSOR ADAPTOR



(57) Abstract: The invention relates to a torque transducer assembly and to a torque transducer incorporating such an assembly. The invention has particular application to measuring torque in a fastening tool in which torque is generated in pulses and to measuring torque in an adaptor mountable to a pulsed-torque type of fastening tool.

WO 2004/018153 A3



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
29 April 2004

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/09349

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B25B23/14 G01L3/10 H02K35/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B25B G01L H02K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 911 119 A (ATLAS COPCO TOOLS AB) 28 April 1999 (1999-04-28) column 3, line 3 - line 27; figure 1	1-4,6-8, 10,11
X	DE 196 38 191 A (KESSLER KARL H) 26 March 1998 (1998-03-26) column 1, line 13 - line 23 column 1, line 43 - line 49; claims 1,5; figure 1	1,2,6,7 8-10,22
A		
X	US 4 918 997 A (POUILLANGE JEAN) 24 April 1990 (1990-04-24) column 1, line 6 - line 32; figure 1	1,2,6,7 8-10,22
A		
P,X	DE 102 17 416 C (GEILENBRUEGGE IVO) 31 July 2003 (2003-07-31) claims 1,12; figures	1,2,6-9
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

18 February 2004

Date of mailing of the international search report

27 FEB 2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Ramos, H

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/09349

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 196 071 B1 (SHOMO ROBERT D) 6 March 2001 (2001-03-06) column 1, line 51 - line 62 column 3, line 29 - line 42 abstract; figures	1,2,6-8, 10,22
A	US 5 315 501 A (WHITEHOUSE HUGH L) 24 May 1994 (1994-05-24) column 3, line 30 - line 33; figure 1	1,10,22
A	US 5 898 379 A (VANBERGEIJK ERNST) 27 April 1999 (1999-04-27) abstract; figure 1	8
A	US 2002/020538 A1 (GIARDINO DAVID A) 21 February 2002 (2002-02-21) cited in the application page 2, paragraph 30; figure 1	1,22
X	US 5 975 714 A (PLATT JAMES VICTOR ET AL) 2 November 1999 (1999-11-02) column 1, line 45 -column 2, line 3 column 3, line 9 -column 3, line 21 column 3, line 56 -column 3, line 65 column 4, line 39 -column 4, line 40 figures 1,2,5	12-20
A	US 3 448 305 A (RAYNAL JEAN ET AL) 3 June 1969 (1969-06-03) column 1, line 14 -column 1, line 24 figures	21
A	US 5 982 059 A (ANDERSON MARTY J) 9 November 1999 (1999-11-09) column 1, line 12 -column 1, line 15 column 2, line 26 -column 2, line 40 figure 1	21

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/09349

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

As a result of the prior review under R. 40.2(e) PCT,
no additional fees are to be refunded.

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-11, 22-24

Torque transducer assembly with a housing surrounding a shaft extending therethrough, a magnetic field sensor assembly being incorporated within the housing

2. Claims: 12-21

Electrical power generator, involving a permanent magnet moving back-and-forth through a coil winding, thereby generating e.m.f.s. in the coil and a rectifier arrangement

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/09349

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0911119	A	28-04-1999	SE 511336 C2 DE 69806113 D1 DE 69806113 T2 EP 0911119 A2 JP 11254340 A SE 9703896 A US 6134973 A US 6341533 B1	13-09-1999 25-07-2002 23-01-2003 28-04-1999 21-09-1999 28-04-1999 24-10-2000 29-01-2002
DE 19638191	A	26-03-1998	DE 19638191 A1	26-03-1998
US 4918997	A	24-04-1990	FR 2612633 A1 AT 64008 T DE 3862984 D1 EP 0285827 A2	23-09-1988 15-06-1991 04-07-1991 12-10-1988
DE 10217416	C	31-07-2003	DE 10217416 C1 US 2003196497 A1	31-07-2003 23-10-2003
US 6196071	B1	06-03-2001	NONE	
US 5315501	A	24-05-1994	DE 4310936 A1 GB 2265728 A ,B JP 2957838 B2 JP 7164344 A	07-10-1993 06-10-1993 06-10-1999 27-06-1995
US 5898379	A	27-04-1999	NONE	
US 2002020538	A1	21-02-2002	US 6311786 B1 CA 2446758 A1 WO 02098612 A1 US 2003098167 A1 US 2003102140 A1	06-11-2001 12-12-2002 12-12-2002 29-05-2003 05-06-2003
US 5975714	A	02-11-1999	US 6220719 B1	24-04-2001
US 3448305	A	03-06-1969	NONE	
US 5982059	A	09-11-1999	US 5793130 A AU 6323798 A WO 9835160 A1	11-08-1998 26-08-1998 13-08-1998

THIS PAGE BLANK (USP)